

What is claimed is:

- 1 1. A storage device comprising:
2 a storage medium having plural storage cells; and
3 a probe to scan across a surface of the storage medium to program the storage
4 cells,
5 wherein the probe is adapted to selectively program each storage cell to one of
6 more than two storage states.
- 1 2. The storage device of claim 1, wherein the probe is adapted to program at least
2 one of the storage cells by generating a perturbation in the at least one storage cell,
3 the probe to selectively cause the perturbation to have one of at least two
4 properties for representing at least two corresponding storage states.
- 1 3. The storage device of claim 2, wherein absence of a perturbation in a storage
2 cell represents one other, different storage state.
- 1 4. The storage device of claim 3, wherein the perturbation comprises a dent, and
2 wherein the probe is adapted to selectively form the dent to have one of at
3 least two depths for representing the at least two storage states.
- 1 5. The storage device of claim 4, wherein absence of the dent in a storage cell
2 represents the one other storage state.
- 1 6. The storage device of claim 2, wherein the storage medium has plural layers,
2 the plural layers having different characteristics to enable selective creation of the
3 perturbation to have one of the at least two properties.
- 1 7. The storage device of claim 6, wherein the plural layers have different melting
2 points.

1 8. The storage device of claim 7, wherein the perturbation comprises a dent, and
2 wherein the probe has a tip heatable to different temperatures to enable
3 formation of the dent having different depths by melting through selected one or more
4 of the plural layers.

1 9. The storage device of claim 8, wherein the dent having a first depth represents
2 a first storage state, and the dent having a second depth represents a second state, and
3 wherein absence of the dent in a storage cell represents a third storage state.

1 10. The storage device of claim 9, wherein the dent having a third depth represents
2 a fourth storage state.

1 11. The storage device of claim 6, wherein the plural layers have different tensile
2 strengths.

1 12. The storage device of claim 11, wherein the perturbation comprises a dent, and
2 wherein the probe is adapted to apply different forces to enable formation of
3 the dent having different depths by breaking through or deforming selected one or
4 more of the plural layers.

1 13. The storage device of claim 1, wherein the storage medium and probe are
2 moveable with respect to each other to enable the probe to scan across the surface of
3 the storage medium.

1 14. The storage device of claim 13, further comprising an actuator to move the
2 storage medium.

1 15. A system comprising:
2 a processor;
3 a storage device comprising:
4 a storage medium; and
5 a probe to selectively form a dent to have one of at least two depths in
6 the storage medium,
7 wherein absence of the dent represents a first storage state, and the at least two
8 depths of the dent represent at least two other storage states.

1 16. The system of claim 15, wherein the storage medium contains plural storage
2 cells, and the probe is adapted to form a dent having a first one of the depths in a first
3 storage cell, and to form a dent having a second one of the depths in a second storage
4 cell.

1 17. The system of claim 16, wherein another one of the storage cells does not have
2 a dent.

1 18. The system of claim 15, wherein the storage medium has plural layers, the
2 plural layers having different melting points to enable selective formation of the dent
3 to one of the at least two depths.

1 19. The system of claim 18, wherein the probe is heatable to a first temperature to
2 form the dent to have a first depth, and the probe is heatable to a second, greater
3 temperature to form the dent to have a second depth greater than the first depth.

1 20. The system of claim 19, wherein the probe is heatable to a third temperature
2 greater than the first temperature to form the dent to have a third depth greater than
3 the second depth.

1 21. The system of claim 15, wherein the storage medium has plural layers, the
2 plural layers having different tensile strengths to enable selective formation of the
3 dent to one of the at least two depths.

1 22. The system of claim 21, wherein the probe is adapted to apply a first force to
2 form the dent to have a first depth, and wherein the probe is adapted to apply a
3 second, greater force to form the dent to have a second depth greater than the first
4 depth.

1 23. The system of claim 15, wherein the dent includes a first dent, and wherein the
2 storage device includes at least another probe to selectively form a second dent in the
3 storage medium to have one of at least two depths,
4 wherein the storage medium defines plural storage cells, the first dent formed
5 in a first one of the storage cells, and the second dent formed in a second one of the
6 storage cells.

1 24. The system of claim 15, wherein the probe comprises a nanotechnology probe.

1 25. A method of storing data, comprising:
2 storing data in storage cells defined in a storage medium; and
3 programming, with a probe, the storage cells to respective storage states,
4 wherein each storage cell is selectively programmable by the probe to one of
5 more than two storage states.

1 26. The method of claim 25, wherein programming the storage cells comprises
2 forming a perturbation in at least one storage cell,
3 wherein forming the perturbation comprises selectively forming the
4 perturbation to have one of at least two properties for representing at least two
5 corresponding storage states.

1 27. The method of claim 26, further comprising the probe programming another
2 one of the storage cells by not forming a perturbation in the another one of the storage
3 cells,
4 wherein absence of a perturbation in the at least another one of the storage
5 cells represents another storage state different from the at least two storage states.

1 28. The method of claim 27, wherein forming the perturbation comprises forming
2 a dent.

1 29. The method of claim 28, wherein forming the dent comprises selectively
2 forming the dent to have one of at least two depths for representing the at least two
3 storage states.

1 30. The method of claim 28, wherein forming the dent comprises forming the dent
2 to selectively have at least one of three depths.